

## CLAIMS

What is claimed is:

- 1 ~~1.~~ An apparatus for maintaining a stable RF level in an optical link, said apparatus  
2 comprising:  
3 a transmitter section;  
4 a receiver section;  
5 a plurality of feedback loops operationally connected to said transmitter section;  
6 and  
7 a plurality of feedback loops operationally connected to said receiver section.
- 1 2. The apparatus of claim 1, wherein the feedback loops perform at least one  
2 function selected from the group consisting of:  
3 i. RF level stabilization effects;  
4 ii. preserve or change optical modulation index (OMI);  
5 iii. adjust output power;  
6 iv. compensate for temperature changes;  
7 v. compensate for laser or system tracking errors;  
8 vi. provide gain at proper places in circuitry; and  
9 vii. provide RF input changes.

1        3.        The apparatus of claim 2, wherein the feedback loops operationally connected to  
2        said transmitter section include a first, second, and third transmitter section feedback  
3        loops.

1        4.        The apparatus of claim 2, wherein the feedback loops operationally  
2        connected to said receiver section include a first and second receiver section feedback  
3        loops.

1        5.        The apparatus of claim 3, wherein the first transmitter feedback loop is a constant  
2        power feedback loop.

1        6.        The apparatus of claim 3, wherein the second transmitter feedback loop is a bias  
2        current feedback loop connected between the transmitter section and an attenuation  
3        circuit in an RF path.

1        7.        The apparatus of claim 5, wherein the attenuation circuit is a PIN transistor  
2        circuit.

1        8.        The apparatus of claim 3, wherein the second transmitter feedback loop is a bias  
2        current feedback loop.

1 9. The apparatus of claim 3, wherein the third transmitter feedback loop provides an  
2 RF level from a back facet monitor.

1 10. The apparatus of claim 9, further including an oscillator operationally connected  
2 to said third transmitter feedback loop.

1 11. The apparatus of claim 10, wherein said oscillator is characterized by an  
2 operational frequency of about 100 kHz.

1 12. The apparatus of claim 10, wherein said oscillator has an output signal, said  
2 output signal coupled to an input of an RF detector, said RF detector having an  
3 attenuating output proportional to said input, and said attenuating output coupled to the  
4 attenuation circuit.

1 13. The apparatus of claim 4, wherein the first receiver feedback loop is an optical  
2 modulation voltage (OMV) feedback loop, said optical modulation voltage feedback loop  
3 connected to RF circuitry in said receiver section.

1 14. The apparatus of claim 4, wherein the second receiver feedback loop is an  
2 oscillator signal feedback loop, said oscillator feedback loop connected to RF circuitry in  
3 said receiver section.

4 15. The apparatus of claim 14, wherein said oscillator feedback loop includes an  
5 oscillator tuned to a frequency of about 100 kHz.

1 16. The apparatus of claim 14, wherein said oscillator feedback loop includes a device  
2 to modulate said oscillator feedback.

106290-1296860

17. A method of stabilizing an RF level in an optical link, said method comprising:

providing an optical signal transmitter section;

providing an optical signal receiver section;

providing a plurality of feedback loops to said optical signal transmitter section;

and

providing a plurality of feedback loops to said optical signal receiver section.

1        18.     The method of claim 17, wherein the feedback loops perform at least one  
2        function selected from the group consisting of:

- i. RF level stabilization effects;
- ii. preserve or change optical modulation index (OMI);
- iii. adjust output power;
- iv. compensate for temperature changes;
- v. compensate for laser or system tracking errors;
- vi. provide gain at proper places in circuitry; and
- vii. provide RF input changes.

1        19.     The method of claim 17, wherein the feedback loops operationally connected to  
2        said transmitter section include a first, second, and third transmitter feedback loops.

1        20.    The method of claim 17, wherein the feedback loops operationally

TOP SECRET - CONFIDENTIAL

2 connected to said receiver section include a first and second receiver feedback loops.

1 21. The method of claim 18, wherein the first transmitter feedback loop is a  
2 constant power feedback loop.

1 22. The method of claim 18, wherein the second transmitter feedback loop is a bias  
2 current feedback loop connected between the transmitter section and an attenuation  
3 circuit in an RF path.

1 23. The method of claim 21, wherein the attenuation circuit is a PIN transistor circuit.

1 24. The method of claim 18, wherein the second transmitter feedback loop is a bias  
2 current feedback loop.

1 25. The method of claim 18, wherein the third transmitter feedback loop provides  
2 an RF level from a back facet monitor.

1 26. The method of claim 24, further including an oscillator operationally connected  
2 to said third transmitter feedback loop.

1 27. The method of claim 25, wherein said oscillator is characterized by an

2 operational frequency of about 100 kHz.

1 28. The method of claim 25, wherein said oscillator has an output signal, said  
2 output signal coupled to an input of an RF detector, said RF detector having an  
3 attenuating output proportional to said input, and said attenuating output coupled to the  
4 attenuation circuit.

1 29. The method of claim 19, wherein the first receiver feedback loop is an optical  
2 modulation voltage (OMV) feedback loop, said optical modulation voltage feedback loop  
3 connected to RF circuitry in said receiver section.

1 30. The method of claim 19, wherein the second receiver feedback loop is an  
2 oscillator signal feedback loop, said oscillator feedback loop connected to RF circuitry in  
3 said receiver section.

1 31. The method of claim 29, wherein said oscillator feedback loop includes an  
2 oscillator tuned to a frequency of about 100 kHz.

1 32. The method of claim 29, wherein said oscillator feedback loop includes a device  
to modulate said oscillator feedback.

1     ~~33.~~     An optical transmission system comprising:  
2             an optical signal transmitter section;  
3             an optical signal receiver section;  
4             an RF stabilization system operationally connected to said optical signal  
5     transmitter section; and  
6             an RF stabilization system operationally connected to said optical signal receiver  
7     section.

1     34.     The optical transmission system of claim 33, wherein the optical transmission  
2     system is a cable television (CATV) system.